REMARKS

Applicants have amended claims 1, 10, 13, 15, 21, 26, 29, 36, and 43. Applicants have cancelled claims 4, 14, 25, and 33. Applicants have added new claims 49-53. No new matter has been added by this amendment.

Claim Objections

Applicant has removed the underlining of the word "fluorinated" in claim 46, as required by the Examiner.

Claim Rejections – 35 U.S.C. § 112

The Examiner has rejected claims 36-42 under 35 U.S.C. §112. Applicant has amended Claim 36 to recite: "forming a fluorine depleted top surface and fluorine depleted sidewalls by simultaneously exposing the top surface and the sidewalls of the fluorine containing film to a reducing plasma." Applicant teaches simultaneously exposing both the top surface and the sidewalls to reducing plasma in order to deplete both those surfaces of fluorine on page 12, lines 18-19 of the specification. It is Applicant's understanding that this amendment is sufficient to overcome the 35 U.S.C. 112 rejection of Claim 36, as well as Claims 37-42, which are dependent upon Claim 36.

Claim Rejections – 35 U.S.C. § 102(e)

The Examiner has rejected claims 29, 32, and 33 under 35 U.S.C. §102(e) as being unpatentable over Pramanick (U.S. Patent 6,054,398). Applicant has cancelled

claim 33. Applicant respectfully submits that claims 29 and 32 are not anticipated by Pramanick because the reference does not anticipate every element of these claims.

With respect to independent claim 29, Applicant teaches and claims: "A method of forming a dielectric, comprising: forming a fluorine containing film on a substrate having a top surface; forming a hardmask layer over the top surface of the fluorine containing film; forming via openings in the fluorine containing film, wherein the via openings define sidewalls; and forming fluorine depleted sidewalls by exposing the hardmask layer and the sidewalls to a reducing plasma." The hardmask protects the top surface of the fluorinated dielectric from the fluorine depletion effects of the reducing plasma.

Pramanick discloses forming a damascene opening prior to performing the plasma pretreatment. (Col. 4, lines 20-60; Fig. 3) As illustrated in Figure 3 of Pramanick, the nitride hardmask layers (114, 117) are not exposed to the reducing plasma. The process disclosed by Pramanick would not protect the top surface of the fluorinated dielectric from the effects of the plasma. Therefore, Applicant respectfully submits that Pramanick does not anticipate all elements of independent claim 29.

Claim 32 is dependent upon claim 29. Thus, for at least the same reasons advanced above with respect to independent claim 29, Applicant respectfully submits that Pramanick does not anticipate all elements of dependent claim 32.

Claim Rejections – 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-7, 21, 23-28, 30, 31, and 34-48 under 35 U.S.C §103(a) as being unpatentable over Pramanick (U.S. Patent 6,054,398). Applicant

respectfully submits that claims 1-7, 21, 23-28, 30, 31, and 34-48, are not rendered obvious by Pramanick because the reference does not teach or suggest every element of these claims.

Regarding independent claims 1, 10, 21, 36, and 42, Applicant teaches and claims a method for forming a dielectric, which includes forming a fluorine containing film on a substrate and exposing the film to a reducing plasma. Applicant teaches that a fluorine depleted top surface is formed, and an etch stop layer is formed over the fluorine depleted top surface. The etch stop layer may exhibit improved adhesion characteristics over a fluorine depleted surface as compared to non-depleted surface. (Page 8, lines 24-27)

Pramanick discloses forming a damascene opening prior to performing the plasma pretreatment. (Col. 4, lines 20-60; Fig. 3) The surfaces of the via and channel dielectric layers 216, 208 are defluorinated in order to provide an adhesion/barrier layer surface 223 for the subsequent deposition of tantalum. (Col. 4, line 60) After tantalum layer 224 is deposited on the adhesion/barrier layer, seed layer 228 is deposited, and a second conductive material is formed on top of the seed layer to fill the via and channel. Finally, Pramanick discloses the use of a chemical-mechanical polishing process to expose the fluorinated second channel dielectric for further processing. (Col. 5, lines 10-30) Pramanick does not teach forming an etch stop layer on the top surface of the fluorine depleted surface. As illustrated in Figure 3 of Pramanick, nitride hardmask layers (114, 117) are formed on the dielectric layers prior to exposing the fluorinated dielectric to the reducing plasma. The nitride hardmask layers of Pramanick are not formed on a fluorine depleted surface.

Therefore, Applicant respectfully submits that Pramanick does not render independent claims 1, 10, 21, 36, and 42 obvious, because the reference does not teach or suggest every element of these claims.

Claims 2-9, 11-17, 23-28, 30, 31, 34-35, 37-41, and 43-48 are dependent upon claims 1, 10, 21, 36, and 42, respectively. Thus, for at least the same reasons advanced above with respect to independent claims 1, 10, 21, 36, and 42, Applicant respectfully submits that Pramanick does not render these claims obvious.

Applicant respectfully requests the removal of the 35 U.S.C. 112 rejection of claims 36-42, the 35 U.S.C. 102(e) rejection of claims 29 and 32, and the 35 U.S.C. 103(a) rejection of claims 1-7, 21, 23-28, 30, 31, and 34-48, and requests an early allowance of these claims.

If there are any additional charges, please charge Deposit Account No 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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Michael A. Bernadicou
Reg. No. 35,934

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300